SOME MEANS BY WHICH MEDICAL SCHOOLS ADAPT TO CHANGING NEEDS*

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I shall present briefly a highly selective review of some of the ways whereby medical schools have changed at certain critical points in their history to illustrate what lessons I can from successful and unsuccessful past efforts to reconcile medical education and society's expectations. I shall then present a perspective for considering the scope or directions of change of medicine and medical education in the future, and I shall discuss some of the specific changes that may address some of society's expectations and some of the ways in which they might be effected.

The Hippocratic school of medicine — confronted by mysticism, empiricism, and fatalism — effected its great change in western medicine by introducing or perhaps reintroducing to medicine and medical education the powerful tools of Greek philosophy: causality, humanism, and the continuing accretion of useful knowledge through recording and analysis of experience. The notion of progress in health care is integral to Hippocratic medicine and thus three great principles of medical education and practice — rationality, humanism, and progress or adaptability — were incorporated, in a sense, as a response to society's expectations.

By 200 A.D. Galen, confronted with a babble of ideas and concepts of health and medical care, responded by creating the order and authority of the encyclopedist. Abandoning the rational inquiry of the Hippocratic school for dogmatism, he produced a great "data base" and his successors clothed it with an authority and rigidity which caused it to dominate medical thinking for a milennium, stabilizing the system to the point of precluding change and progress. While this occurred as a part of the broad social phenomena of the Dark Ages, it nonetheless illustrates well the

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potential tyranny of a data base or a system which, for whatever reason, becomes inaccessible to change.

After nearly 1,000 years, the medical schools, from which grew the first western universities at Salerno, Padua, Bologna, and Paris, were practical places often associated with hospitals. There was real emphasis upon the care of patients, as illustrated by the great clinical textbooks of the 12th century and by the reintroduction of Hippocratic observation and reasoning as a basis for the challenging of clinical authority. From about the 10th to the 12th century, medical schools continued to interact effectively with both the early universities and with the health care system of the day. During this time, the principal advances of health care were made within the medical schools and were disseminated by the medical schools.

But then, from about 1500 until early in the 19th century, much of medical education, like the universities of the day, largely withdrew again into authoritarianism, now mixed with scholasticism. Many medical schools no longer dealt effectively with the issues or concerns of greatest interest to society and, as a result, many of the most significant advances in medical sciences (as in other sciences) occurred outside of the medical schools. A lesson of this period is that if medical schools do not change appropriately, society simply passes them by, and it may do so for centuries.

Then, in the latter half of the 19th century, as the powerful social instrument of university-based science linked to practical problems of society was being forged in the great German universities, this model was renewed in many medical schools in Europe and was imported with some modification to the Johns Hopkins University School of Medicine at the end of the 19th century. Goaded by several forces, medical schools of this country changed during the early years of this century in at least two important ways: first, they moved closer to the academy, both organizationally and by the incorporation of academic standards and behavior, and, second, the medical schools incorporated a base of formal science including emphasis on the generation of new science while retaining, through Sir William Osler and others, a Hippocratic emphasis on the patient and on clinical phenomena as a focus of learning. The clear evidence of value and effectiveness of the new model of medical education was the true energy source that drove the change while the response to the Flexner report and other forces contributed, in my view, by shaping the change.

It was at this time that the general institutional separation of the schools of medicine and the schools of public health occurred in the United States.

Several medical schools changed by narrowing the scope of medical education to limit emphasis on public health while enhancing the focus of medicine upon care of disease in the individual patient.

Following World War II, this nation turned to its medical schools for leadership in building upon the scientific advances and the promises growing out of World War II to exploit the "endless frontier" for the advancement of health care. It was not inevitable that medical schools should respond by developing and incorporating much of the great biomedical research engine of the nation. Certainly the medical schools changed in part because of the lure of the federal funding of biomedical research, but the schools were responding in part to a social imperative and to a very pragmatic judgment of the potential effectiveness of the development of a strong scientific base in fulfilling society's expectations. Indeed, a number of medical schools accepted a substantial loss of historically cherished values as they emphasized the development of biomedical science after World War II. In many institutions the cherished dignity of advanced clinical practice was eclipsed as a part of the institutional emphasis on laboratory-based biomedical science.

Another change in medical schools that illuminates the possible ways in which medical schools change is the response of the nation's medical schools to the apparent shortage of physicians as perceived in the late 1950s and throughout most of the 1960s. The Association of American Medical Colleges and many individual medical schools responded and participated in the response of the entire system well before the federal government offered its modest incentive. The process involved in responding to the need for change by enlarging the medical education enterprise included recognition and acceptance of the need to expand by the medical schools, development by informed individuals in and out of the medical school of a means of responding, which was perceived to be conservative in the sense that other values precious to the system were thought to be preserved, and the provision of some kind of an incentive in the form of expectation of benefit as a result of the response to the change.

The ways in which the medical schools expanded between 1960 and 1980 illustrate the important diversity of the medical education system. Most schools expanded significantly but some expanded very little, purposefully choosing to concentrate on meeting other societal expectations. In some states several new medical schools were created while in others a decision was made not to develop new schools but to expand existing schools. The variation in capability of response among American medical

schools is an important fact that conditions the ways in which medical education can respond to many of society's expectations.

The social benefit of increasing access to health care by increasing the number of physicians outweighed all other considerations as most of the medical schools of the nation expanded substantially and supported the development of new schools. Despite the variable response among the schools, many now believe that the schools over-responded.

A further illuminating example of change in the medical schools of the nation is the shift from emphasis upon the education of specialists to emphasis upon the education of generalists or primary care physicians beginning in the early 1970s. Again there was considerable variation in the specific response among the medical schools. In this case, I believe that medical students had begun to shift their career choices toward primary care specialties in response to apparent social need even before the institutions had begun to respond organizationally. The students themselves are one source of change. Within about 15 years a new specialty, family medicine, has been created and institutionalized, and with this and the expansion of primary care internal medicine and pediatrics the balance between specialist and generalist now seems more appropriate.

Certainly the most often described and lamented failure of medical education for a long time has been the perceived lack of success in the education for sensitive and humanistic practice. Our apparent failure has not been for want of trying. Exhortations, codes, role models, and selection criteria have all been used for centuries. The judgments of the effectiveness of our efforts are mixed. I do not know a medical educator who is satisfied with our current ability to select or to educate for the humanistic practice of medicine. Those who observe the profession as a whole are often highly critical of the lack of humanism in education and in practice. But many surveys, like that presented by Mr. Burson at this symposium, suggest that a majority of our people when asked directly assert that they have a highly satisfactory relationship with a physician. While most schools have recently broadened their faculties to include ethicists and philosophers and most offer at least some formal coursework, I conclude that our medical schools still have not been able to develop a successful formal or controlled process for the humanistic education of the physician.

The failure of the medical schools to change in this regard is due, I think, not to disdain for the purpose but rather to the failure to develop a convincing educational process.

This historical review suggests that change in medical schools in response to society's needs has often been based upon a broad recognition of the need for change on the part of the faculty as well as society, on enlightened leadership within the medical schools, and sometimes on pressures external to the medical school. Medical schools seem to have changed most often when conservative judgment led to the conclusion that societal benefit was likely to occur without disproportionate adverse consequences. On several occasions, medical schools have shown willingness to change despite compromise of vested interests and long held values but only when the weight of expectations seemed to overwhelm the inertia of the status quo. Finally, medical schools have not always changed when they should and, on the most important occasions when medical schools opted out of needed change, the world went on around them to their and the world's disadvantage.

In sum, however, the record of the medical schools in accommodating to the needs for change compares reasonably, I think, with that of other institutions of society. How well we are doing depends in part on the values and the perspectives of the observer. Some of the most fundamental indices of the nation's health status reflect dramatic and continuing improvement, due at least in part to medical care and the responsiveness of medical education. For example, the mortality has improved in every age group in every five year period since 1965 in the United States. Further, the age specific mortality improved each year between 1970 and 1980 in the United States for men and women and for blacks and whites at a rate which is exceeded by only three other nations in the world.* In the United States but not in the United Kingdom, for example, the gap between the health status of the poor and that of the middle class has been reported to be narrowing.

Despite our substantial success, there remain very important unmet needs, some of which are of a magnitude to threaten the basic effectiveness of the health care system. I shall now consider some of the needs which seem unmet and the ways in which our medical schools can contribute to addressing them.

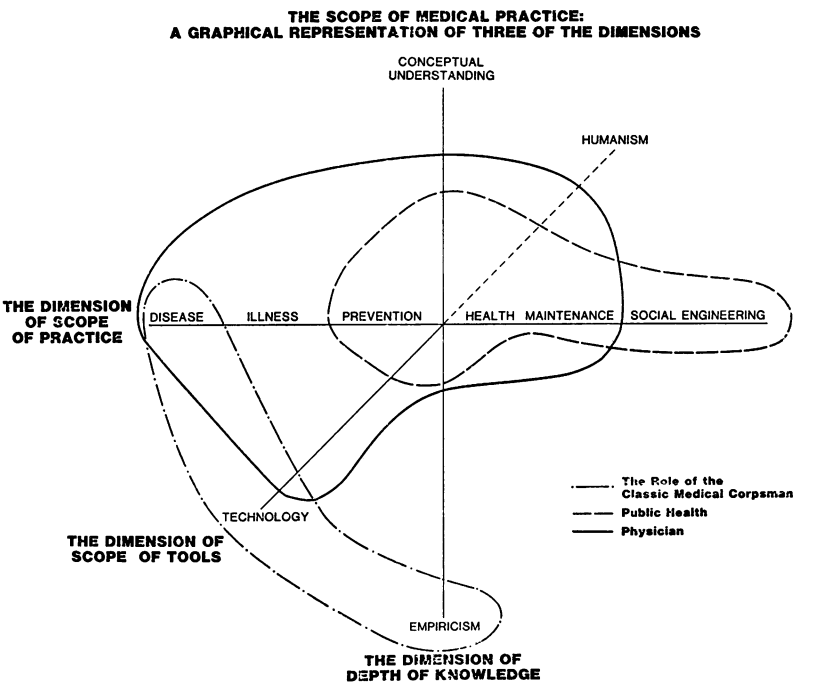
To identify unmet expectations, it is helpful first to consider the scope of the expectations or the scope of the potential professional activities of physicians. One can consider the scope of medicine using the concept of a dimensional space. Let me put forward briefly an illustration using just

Health. United States. U.S. Department of Health and Human Services, December 1981.

three of the several major dimensions that determine the scope of medicine. For example, one can conceive of a dimension of the scope of practice ranging from treatment of overt acute disease of an individual patient at one end of the spectrum through preventive medicine and public health to social engineering on the other end of this dimension. Certainly society expects physicians to be able to treat acute disease. But how far toward social engineering should physicians be educated to go? A second dimension of the scope of medicine might be labeled the dimension of tools. This dimension ranges from complex advanced technology, through simple technology to personally applied humanism. To what extent does society expect its physicians to be able to manage or apply current or future advanced technologies? Are there aspects of humanism that society deems beyond its expectations of physicians? Freud did not judge physicians to be the best base for psychoanalysis. Our culture has largely eliminated the involvement of the physician in the interface between religion and health care. Should religion be excised from governmentally supported medical education, consistent with the First Amendment? Is this society's expectation? A third dimension of scope might be the dimension of depth of knowledge. This dimension can be conceived as ranging from simple empirical association through definitive conceptual understanding. Various acts of medical practice fall somewhere between these extremes, and in the aggregate we can address the question of how much conceptual understanding society expects its physicians to possess.

One could imagine that every professional act of a physician could be represented by a point on these and other dimensions. If these particular dimensions are oriented around a common point as in the figure, a space is created in which the practice of medicine generally or that of individual physicians can be viewed as being defined. I do not propose to try to represent medical education or practice rigorously in this way, for the scales would surely be nonlinear and the number of dimensions required would be very large if not infinite. On this figure, the scope of practice of two other sources of health care as well as that of the physician is represented.

I present this simple analysis only to make two points: First, it seems to me that it may be worthwhile to consider in an orderly and formal way the scope of medicine in relation to other elements in the health care system as a basis for informing and guiding the evolving response to society's expectations. Second, it is important to consider the response of medical education to society's expectations as the response of an integrated system



and not as a series of independent bidimensional issues for the multiple dimensions of medical education and practice are interactive, sometime in surprising ways. One cannot adjust the cost of health care, for example, without influencing many other dimensions. This interaction is one of the subtle but powerful forces that determines the evolution of medical education and practice.

What then are some of the important changes needed in medical education and how can we best assure reasoned, appropriate, and effective change?

First, the scientific basis of medical practice will wither if not supported as an essential, integral, and primary element in medical education. Indeed, one of our greatest and most refractory pedagogical challenges is the formal integration of education in clinical biologic science. Our society has a degree of faith in reason that causes it to expect its physicians to have or to be capable of a conceptual level of insight into its health problems. It is not that every physician is expected to be a master biologic scientist but rather that the practicing physician is usually expected to have reasonable conceptual insight into those biologic and social systems which he observes or modulates in the care of his or her patient. I

believe that we are meeting this expectation marginally in general and that we must not ignore or neglect it as we address other important needs and expectations.

Society expects our graduates to be able to incorporate new technology parsimoniously and appropriately. We have only primitive means of technology assessment and for the most part little or no explicit formal education in the assessment and appropriation of technologies. As explicit technology assessment spreads through our medical schools and through medical practice, driven by linkage to payment, associated educational programs may possibly develop. This process could be accelerated if the federal government would invest appropriately in this source of substantial potential savings.

How can medical education help to meet better the societal expectations that physicians should be caring and humanistic? Most admissions committees have consistently mixed emphasis on hard science and grade point average with an emphasis on human characteristics as criteria for admission. But this fact, if it be so, has scarcely penetrated the folklore of the medical school applicants or advisors, in some places at least, and we need to be more convincing.

I believe that the most powerful stimulus for the young adult to a lifetime of humanistic practice occurs in the apprentice relationship which we now prefer to designate "role model." I hope to see a strengthening of the effectiveness of education for humanistic practice through the enoblement of such practice as a more respected activity in academic medicine because I believe that we have an untapped reservoir of skilled and humane academic clinicians. As a further means to improve education for humanistic practice, many medical schools have greatly improved their ability to give their students a formal basis in ethics, philosophy, anthropology, sociology, and health policy.

We do not seem to be meeting well society's expectations for preventive and health-promoting services from physicians. If this is correct, the medical schools are limited in their ability to respond in part by the lack of appropriate faculty, the fact that the discipline of disease prevention and health promotion as applied for the individual by the physician has not been well developed, and by the fact that a proven and generally accepted pedagogy does not exist in this field. For medical practice to incorporate a significantly larger element of disease prevention and health promotion than is presently the case, both time and additional resources will be required. Since effective involvement of the physician in disease preven-

tion and health promotion will require of the physician greater facility as an educator and with techniques of behavior modification, these aspects of the present educational programs will need to be strengthened and better organized. Change of this type has often been accelerated when a few well-defined and successful models were developed.

Finally, we are not doing as well as we must in educating our students to participate appropriately in the complicated, inescapable, and growing task of selective application of health care resources and in the pursuit of economy in practice. This competence has not been high among society's expectations until relatively recently or perhaps it would be more accurate to say that we lost this orientation during the affluent 50s and 60s. Many schools have recently developed considerable emphasis in educational programs at all levels on the containment of unnecessary costs. There is a substantial literature in which these educational experiences are described and there is some analysis as to the effectiveness of the different types of programs. To help to meet this need, every medical specialty should develop an informed perspective on economical practice which it both promulgates and practices. But, in addition, the gap between what the physician might do and what he will do will surely widen. The physician cannot escape a role as the gatekeeper of access to health care and we need to prepare our students better for this role. Here, there is, I think, a very substantial, unresolved, and not often discussed conflict between the role of the physician as advocate for the individual patient versus the role of the physician as a gatekeeper in the allocation of societal resources. There are interesting parallels between this issue in medicine and the recent contentious deliberations of the American Bar Association concerning the conflict between the responsibilities of attorneys to their clients and to society. I suspect that this conflict reflects divergent and evolving views in our society of the relationship of the individual to the group and that the physician will respond imperfectly to society's expectations for him in cost containment until our society improves its own resolution of the prerogatives of the individual in relation to those of the group and until a satisfactory means of reconciling the obligation of the physician to the individual patient with the obligation to contain cost is found.

The medical schools of the nation are a diverse lot. Many operate at the margin of financial responsibility and stability in their effort to address better societal needs and expectations. No school is intended to address all of society's expectations and many schools are designed to educate with selective emphasis on specific societal expectations. Medical education in

this country is in a sense a system. Viewed as a system, the nation's medical schools clearly have the capability of adapting to changing societal expectations. The medical schools have, in fact, provided valuable societal assets through their adaptation to changing expectations while at the same time leaving important and urgent opportunities for improvement.